Group Appointments & Lifestyle Coaching To Reduce Complications of Type 2 Diabetes In Primary Care Settings

Natalie Manhard

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ABSTRACT

Type 2 diabetes is a common illness and affects many people. It will afflict approximately 7 million people yearly and reach epidemic proportions by 2025 (Canadian Diabetes Association, 2008). This project provides an overview of literature from 1998-2008 supporting group medical appointments as a means for overseeing type 2 diabetes care, with an emphasis of self-management and nurse practitioner coaching in chronic disease management.

The University of Northern British Columbia Library database provided accesses to specific search engines including: i) Medline (Ovid, EBSCO) and the Cochrane Data Base of Systematic Reviews. Specific key search terms included: diabetes mellitus, type 2 diabetes mellitus, internal-external control, primary health care, group medical visits and nurse practitioner coaching. The literature review generated a large number of research articles that addressed North American (Canada, U.S.), European; and UK Health Care Systems. The search was narrowed to 31 journal articles. The literature review supports the ongoing development of the medical group appointments in primary health care and strengthens the notion that nurse practitioner coaching is a valuable intervention for motivating patients to participate in self-management with their diabetes.

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Natalie Manhard

TABLE OF CONTENTS

GLOSSARY

Body Mass Index (BMI)

BMI is describes the body weight relative to their height and in adults correlates to the amount of total body fat content (http://www.medterms.com/script/main/art.asp?articklekey=16125).

The BMI nomogram is not be used for person's under 18 years of age or pregnant woman (Health Canada, 2003).

Health Risk Classification According to Body Mass Index (BMI)

Classification	**BMI Category (kg/m^2)**	**Risk of developing health problems**
Underweight	< 18.5	Increased
Normal Weight	18.5 - 24.9	Least
Overweight	25.0 - 29.9	Increased
Obese class I	30.0 - 34.9	High
Obese class II	35.0 - 39.9	Very high
Obese class III	>= 40.0	Extremely high

Note: For persons 65 years and older the 'normal' range may begin slightly above BMI 18.5 and extend into the 'overweight' range (Health Canada, 2003).

Cholesterol

Cholesterol is a waxy substance produced by the liver to protect nerves, make cell tissues and produce certain hormones. Increased consumption of foods that contain cholesterol can have negative impacts on a person's health such heart disease or stroke (Heart and Stroke Foundation, 2009).

Diastolic Blood Pressure

During relaxation of the cardiac cycle, blood fills the ventricles. Normal Range for diastolic blood pressure is 60-90 mmHg (McCance, 2006).

Estimated Glomerular Filtration Rate (eGFR)

This test measure how well the kidneys filter blood over a period of time. The eGFR is calculated from the age, sex and blood creatinine level of a patient (http://www.patient.co.uk/showdoc/27001111/).

Group medical appointments

Group medical appointments consist of providing individual one to one care in a group setting of other patients. Group appointments are a multidisciplinary team approach to health care that delivers integrated care services and improves patient access that improves quality care (Northern Health Authority, 2007).

Glycosylated Hemoglobin (HgbA1c)

This blood test measures of blood glucose levels over the previous 120 days. This blood test is measured approximately every three months (Canadian Diabetes Association, 2008)

High Density Lipoprotein (HDL)

HDL protects the arteries by removing the build up of LDL in the blood stream (Heart and Stroke Foundation, 2009).

Incidence

This term refers to the frequency of which a disease occurs in a particular population. In epidemiology, this reflects the number of new cases diagnosed in a particular year (http://www.medterms.com/script/main/art.asp?articlekey=11516)

Integrated Health Networks

Integrated health networks are a new way of caring for patients who have complex medical health conditions. If physicians have joined an integrated health network, they will have

access to multiple resources. These resources may include access to dieticians, certified diabetes educators, and chronic care coaches (Impact BC, 2007).

Low Density Lipoprotein (LDL)

LDL delivers cholesterol to the body. Elevated lipoproteins can clog up arteries and are associated with an increased risk of heart disease and stroke (Heart and Stroke Foundation, 2009).

Nurse Practitioner

Nurse Practitioners are experienced nurses who have a Master's Degree in Nursing and have taken advanced clinical training. Their education prepares them to diagnosis/treat common health problems, write prescriptions, order tests and refer patients to other health care providers including physician specialists (CRNBC, 2009).

Prevalence

This term refers to the number of specific cases of a disease within a defined population and given time frame (http://www.medterms.com/script/main/art.asp?articlekey=11697).

Primary Health Care

Primary health is essential health care for both individuals and families and is client centered. Primary health care focuses on people staying healthy, living and coping with chronic health conditions and the care provided is a multidisciplinary integrated approach to health and wellness (BC Ministry of Health, 2007).

Self-Management

Self-management refers to the individual's ability to live well with one or more chronic health conditions and to be self-confident in medical management, emotional management and role management of their health (McGowan, n.d)

Systolic Blood Pressure

The force exerted by the left ventricle of the heart that propels the blood from the left ventricle out into the circulation. Normal systolic pressure is 90-140 mmHg (McCance, 2006).

Type 2 Diabetes

Type 2 diabetes is a chronic health condition which results from the body's ineffective use of insulin and is often related to excess body weight and inactivity (World Health Organization, 2009).

Triglyceride

Triglycerides are a form of fat in the bodies. Triglyceride is associated with increased simple sugars, refined carbohydrates, sedentary lifestyle, lack of exercise, alcohol and poorly controlled diabetes (Heart and Stroke Foundation, 2009).

SECTION ONE

BACKGROUND & NEED

Incidence & prevalence of diabetes

Diabetes is a long-life chronic disease that is not curable and relies on the individual to acquire the necessary self-management tools to properly care for their health condition. The treatment approach for diabetes is to promote self-management that enables the individual to lead a healthy life with fewer health complications. Diabetes self-management is considered to be one of the hallmarks of patient learning in managing their diabetes from the time of their diagnosis (Funnell et al., 2008).

It is estimated that 246 million people are affected with diabetes world-wide with a further 7 million people developing diabetes each year; this number is expected to rise to 380 million people by 2025 (Canadian Diabetes Association, 2005-2008). The World Health Organization (WHO, 2003) suggests that unless there is appropriate action taken, the rate of type 2 diabetes will exceed 350 million people by 2030. The prevalence of type 1 diabetes is approximately 10% of the population. Type 2 diabetes is steadily increasing and is associated more with obesity and sedentary lifestyles. Aboriginal people have a three to five times' higher rate of diabetes compared to non-Aboriginal people. The prevalence of diabetes in new Canadians is approximately 80% which includes populations of Hispanic, Asian, South Asian and African populations (2008).

Risk factors and screening for type 2 diabetes

The recommended screening guidelines by Canadian Diabetes Association (2008) suggests screening for diabetes should include a fasting plasma glucose (FPG) and ought to be performed on all individuals over 40 years of age every 3 years and more frequently in

people with additional risk factors. The Canadian Diabetes Association (2008) guidelines recommend that individuals with additional risk factors should have earlier testing with FPG or 2h plasma glucose (PG) in a 75-g oral glucose tolerance test (OGTT). Table 1 outlines clinical conditions and co-morbidities to additionally consider when screening patients (2008).

Table 1. Clinical Conditions & Co-Morbidities for Consideration.

First degree relative with type 2 diabetes
Member of high-risk population (e.g. people of Aboriginal, Hispanic, Asian, South Asian or African descent)
History of IGT or IFG
Presence of complications associated with diabetes
Vascular disease (coronary, Cerebrovascular or peripheral)
History of gestational diabetes mellitus
History of delivery of a macrocosmic infant
Hypertension
Dyslipidemia
Overweight
Abdominal obesity
Polycystic ovary syndrome
Acanthosis nigricans

Cost of diabetes

Type 2 diabetes is on the increase and it is estimated that 60,000 people will be diagnosed yearly in Canada (Health Canada, 2006). Data from the Canadian Diabetes Association (2007) indicates that there are 250,000 (6%) British Columbians that live with diabetes and there are approximately 125,000 British Columbians that are unaware that they have diabetes. The financial burden of diabetes can run from $1000 to $15,000 per year. In addition, it is estimated that diabetes will cost the medical system up $15.6 billion per year

by 2010 and up to $19.2 billion per year by the year 2020 (Canadian Diabetes Association, 2005-2008).

Regional clinical data

The author of this project was able to obtain current data on the provincial prevalence cases of diabetes from the Primary Health Care Registry – Diabetes 2001 to 2007, which was a daunting number of 184,882 cases (C. Thibault, personal communication, May 26, 2009). The incidence of diabetes for 2001 to 2007 was 21,541. Mortality cases associated with diabetes for 2001 to 2007 was 6,157 cases. Further exploration suggests that diabetes is on the rise in both the Northern (NHA) and Interior Health Authorities (IHA). Total cases in NHA were 3100, with a mortality rate of 62%, whereas total cases for IHA was 4,386, with a mortality rate of 34% (2009).

Demographics of Kamloops

Kamloops is situated in south-central British Columbia at the confluence of the North and South Thompson Rivers and is the second largest city in the BC Interior (Super Natural British Columbia, 2009). The 2006 population of Kamloops was 80,736 compared to the population identified as Aboriginal in Kamloops was 5,165 persons as Aboriginal; while the population of visible minorities was 5,165 persons (Statistics Canada, 2006).

Kamloops Downtown Health Centre

The Kamloops Downtown Health Centre (KDHC) is one of eight primary health care centers located in the Interior Health Authority [IHA] (Interior Health Authority, 2009). The primary health care centre service includes the city of Kamloops and the surrounding area. The number of patients in the KDHC has steadily increased. Previous numbers from October 2008 indicated that 285 patients with a diagnostic code of 250.0 (type 2 diabetes) were

registered at KDHC (J. Mac Innes, personal communication, February 5, 2009). Based on informal discussion with health care providers at KDHC, it was believed that more patients in the clinic had diabetes and encounter visits were not coded properly.

Recently, a new physician has transferred her practice to KDHC and it is estimated that there are approximately 900 registered diabetic patients within that individual practice (Personal communication, Dr. S. Vlahos, 2009). It is estimated that there are now approximately 1100 patients with type 2 diabetes at KDHC with the addition of the new physician and her practice. These numbers do not reflect the ongoing newly diagnosed diabetic or pre-diabetes patients at KDHC as this information was unavailable. Many of the patients with diabetes have secondary diagnoses such as obesity, hyperlipidemia, metabolic syndrome, hypertension, depression as well as other co-morbidities.

The challenge KDHC faces is ensuring scheduled follow-up of patients at 3 or 6-month intervals and review of baseline levels such as HgbA1c, blood pressure, weight, and cholesterol as defined by the current clinical practice guidelines (British Columbia Ministry of Health- GPAC: Guidelines and Protocols Advisory Committee, 2009).

Group medical appointments in primary care settings

Diabetes is a growing problem internationally, nationally, and provincially. Evidence outlined in the following sections suggests that group medical appointments (GMA) may empower and enable participants to gain greater tools to assist in the self-management of their diabetes. Diabetes is a complex health issue and by providing a multidisciplinary approach to chronic disease management, patient outcomes may be improved.

Collaboration among health care providers is vital for providing timely efficient health care. Health care providers can motivate patients to engage in self-management. The

province of British Columbia has developed unique partnerships with health authorities and the BC Medical Association through *Integrated Health Networks (IHN)* as a means for providing medical care for complex chronic health conditions with a multidisciplinary team approach. As a multidisciplinary team, the health care providers and the administrative staff have decided that GMAs would be an important health service option to augment the programs that are provided at KDHC.

The health care team members include: nurse practitioners, physicians, a primary care nurse, medical office assistants, a certified diabetes educator or dietician, and a mental health clinician. The GMAs are conducted twice monthly and provide an opportunity for participants to register for a class which is approximately 1.5 to 2 hours in length. In brief discussions with the providers, it was determined that a mental health component related to stress and wellness with chronic disease would be an important educational session to add to the GMA.

Generally, the GMAs consist of stations to measure blood pressure, height, weight, waist circumference and body mass index (BMI). The participants rotate through these assessment stations and have an individual appointment with a nurse practitioner or physician to specifically discuss issues pertinent to their diabetes. Other aspects of the appointment include a session with either the dietician on carbohydrate counting, as well as sessions to address cardiovascular and mental health issues during the one hour of education. During GMAs participants are encouraged to share their stories of successes and challenges in their self-management of their diabetes.

To enhance self-management abilities, sessions focus on providing education to patients diagnosed with diabetes and pre-diabetes. Self-management involves a collaborative

process which involves key stakeholders that include the patients, health care providers, and diabetes educators. Group appointments provide an opportunity for patients to be involved in a multidisciplinary team approach to health care. A number of the participants who have attended these GMAs have also attended diabetes teaching clinics and still strive to reach target controls for HgbA1c, cholesterol, and blood pressure. The goal of the GMAs is to increase participants' knowledge and further empower them to become more self-aware of target controls for blood pressure, cholesterol, HgbA1c, and to actively participate in self-management of their diabetes.

Question of inquiry

In order to assess the validity of GMAs in patients with type 2 diabetes, a review of current literature was undertaken. The purpose of the review was to determine an evidence-based approach to chronic disease management, specifically related to type 2 diabetes self-management and to further develop GMA at the KDHC. As part of the project, the following question of inquiry was formulated:

1. Do group medical appointments and nurse practitioner coaching improve patient-related clinical outcomes in people diagnosed with type 2 diabetes compared to individual office appointments?

Significance of the project

Clients are faced with emotional and physical challenges daily when living with a chronic health condition and it is important for them to receive continued support with lifestyle changes that guide them to improved health. Self-management consists of learning healthy lifestyle behaviors and setting manageable goals that improve their health. GMAs provide patient-centered learning that encourages their own personal knowledge in self-

management. This project is important because it demonstrates how the GMA can impact self-management of type 2 diabetes. More importantly, the GMA provides an opportunity for nurse practitioners to impact healthy outcomes for patients with the disease as they facilitate the GMA process for patients in the primary care setting where they are employed.

Section two outlines the processes utilized to identify literature related to GMAs, as well as summarizes key literature reviewed in this area. The literature supports GMAs and suggests that nurse practitioner coaching is an effective intervention for motivating patients in self-management of their type 2 diabetes.

SECTION TWO

REVIEW OF THE LITERATURE

The purpose of the literature review was to uncover existing information related to: type 2 diabetes and group medical appointments, self-management of the disease, locus of control, and nurse practitioner coaching as an intervention in motivating patients to take more responsibility for management of their diabetes.

Search processes and criteria

A number of researched journal articles were reviewed and found not to be specific to the topic, however they were included as background information to support and provide a greater understanding of the topic. The search strategies included: i) electronic data bases; ii) websites and electronic searches of relevant journal articles and, iii) key informant contacts.

A review of relevant data bases was conducted for the period January 1998 to December 2008. Data bases utilized for the search process included Medline (Ovid; EBSCO), the Cochrane Database of Systematic Reviews, and Clinical Practice Guidelines and Protocols in British Columbia and Impact BC website. The University of Northern British Columbia library was accessed for the literature search. Specific search terms included: type 2 diabetes mellitus, locus of control, primary health care, nurse practitioner and coaching, and group medical appointments. Table 2 highlights the inclusion and exclusion criteria utilized for the literature search.

Table 2. Inclusion & Exclusion Criteria for the Literature Search

Inclusion Criteria:
Published in English
Published Between 1998-2008
Addresses North American (Canada, U.S.), European; and UK Health Care Systems
Published paper applying any type of method of research that was pertinent to type 2 diabetes and group appointments, self management and nurse practitioner coaching
Exclusion Criteria:
Published in Non-English Languages
Published Prior to 1998
Addressing Health Care Systems Other Than Those for Inclusion Criteria
Editorial and/or Book Reviews

Key informants

Discussion with specific team members within the KDHC regarding numbers of patients with a diagnosis of type 2 diabetes, as well as current data from the primary care registry in providing up-to-date data on type 2 diabetics within the health region was conducted. A list of current patients with a diagnosis of type 2 diabetes registered at KDHC was obtained from the patient registry within the clinic itself.

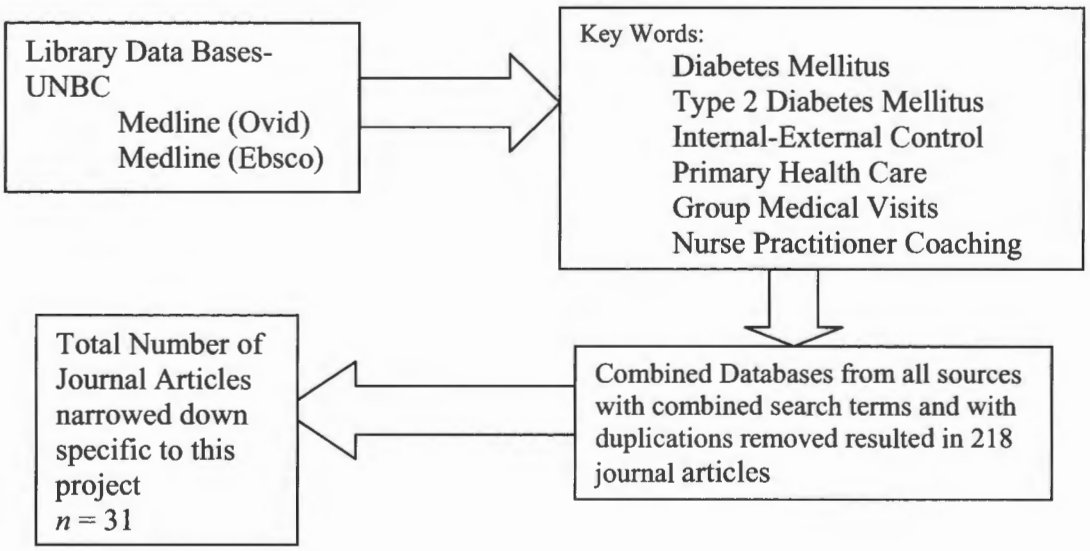
The next phase of the literature review consisted of rigorous analysis of the documents that were specific to the research project and one-by-one they were either included or excluded based on the criteria determined.

Results of the literature search process

The combined search strategy was narrowed down to thirty-one journal articles based on the search criteria previously described. The majority of the research stems from the US (n = 24), followed by the UK (n = 4), then Europe (n = 2), and finally Canada (n = 1). The

following figure represents the process involved narrowing down the appropriate journal articles appropriate to the project.

Figure 1: Search Strategy Results



The key words that were applied in the search for appropriate and relevant research articles resulted in a large number of articles that were not necessarily pertinent to the question of inquiry. Two specific clinical practice guidelines on best practices for diabetes management in British Columbia and self-management guidelines that are incorporated into the care of patients with type 2 diabetes were reviewed. The remaining literature evaluated GMAs versus single office visits to promote and support self-management, self-efficacy (locus of control) and nurse practitioner coaching as an intervention to support patients with day-to-day living with their diabetes. The purpose of the literature review was to gain a better understanding in the further development of group medical appointments at the KDHC. Results of the literature search provided some important evidence related to GMAs as discussed in the following sections.

Clinical practice guidelines

The first clinical practice guideline reviewed was obtained from the British Columbia Ministry of Health Guidelines and Protocols Advisory Committee – GPAC (2009). The guideline "Diabetes Care" is very comprehensive and contains best practice guidelines from the Canadian Diabetes Association (2008). The guidelines provide succinct and recommended practice and outcome measurements which are pertinent to clinical practice. The guidelines are equipped with learning resources for both the practitioner and patient. For ease of tracking improved patient outcomes, a diabetes patient care flow sheet is provided which focuses on care objectives, self-management topics, a means for documenting visits at 3 to 6-month intervals, and suggestions for monitoring laboratory and screening for neuropathies and retinopathies (British Columbia Ministry of Health- GPAC (2009).

The second clinical practice guideline pertains to standards for diabetes self-management education. Funnell et al. (2008) provides guidelines on self-management education for patients with diabetes and emphasizes the importance of incorporating lived experiences of patients when developing and establishing goals toward achieving self-management. The guidelines specifically focus on ten key areas on self-management which are listed in Table 3 (2008).

Table 3. Ten Key Areas on Self Management

1. Diabetes self management education having specific goals,
2. Appointing an advisory group for quality care of diabetes,
3. Assess the educational needs of the target population,

4. A coordinator is assigned in planning of the self-management education,
5. Appropriate instructors will be provided in diabetes management,
6. Written evidence reflecting current evidence in diabetes management,
7. Assessment and educational plan developed in collaboration by the participant and instructor,
8. Personalized follow-up of self-management,
9. Measure the attainment of patient defined goals,
10. Measure the effectiveness of the diabetes educational process and improve on opportunities and processes

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Group medical appointments

Ciechanowski et al. (2001) postulated that patient's satisfaction and participation in the patient provider relationship can be best explained by applying the Adult Attachment theory. The Adult Attachment theory explains how individuals internalize their experiences with caregivers (Bowlby, 1973). Individuals with secure attachment will generally experience consistent care given by a health care provider, whereas adults with dismissing attachment experience care giving that was emotionally unresponsive will develop strategies where they become more self-reliant (1973). In contrast, adults who experience preoccupied attachment will generally have inconsistent responses and are seen as clingy or display poor self esteem. Fearful individuals will generally have characteristics of preoccupied individuals and desire social contact (1973).

Ciechanowski et al. (2001) contend that patients who had exhibited dismissing attachments and felt that their provider-patient relationship communication was poor often had higher glycosylated hemoglobin levels. The major variables comprised of seven self-

reported questionnaires in which two of the seven questionnaires pertained to relationship scale questions. The authors reviewed a number of self-reporting instruments which included the SCL-90-R, The Diabetes Knowledge Assessment scale and Self-Care Activities questionnaire. Clinical data examined HbA1c levels as well as ratings of chronic disease index scores, comorbidities, and interruption adherence from filled prescriptions.

Data was analyzed using SPSS 8.0 for Windows. Two-tailed and chi-square tests were performed. An analysis of covariances (ANCOVA) was performed to assess if glycosylated hemoglobin levels varied depending on the level of attachment (secure, dismissing, preoccupied, or fearful) and communication quality (poor or good). The data examined included the 367 questionnaires from the 588 that were mailed out to participants who either had type 1 or type 2 diabetes.

Final results of the study demonstrated that patients with dismissing attachment had significantly higher HbA1c levels ($M = 7.99\%$, $SD = 1.49\%$) compared to patients with preoccupied attachment ($M = 7.38\%$, $SD = 1.23\%$). Patients with secure attachment had lower HbA1c levels ($M = 7.49\%$, $SD = 1.24\%$). Fearful attachment styles were similar to secure levels of attachment ($M = 7.47\%$, $SD = 1.32\%$). The findings did demonstrate that provider relationship and communication was associated with higher HbA1c levels ($F = 2.74$, $df = 3, 292$, $p < 0.05$). It was noted that patients who experienced dismissing attachment and perceived that their level of communication with their provider was not as secure, had poorer HbA1c levels ($M = 8.50\%$, $SD = 1.55\%$) as compared to those whom experienced good provider communication ($M = 7.49\%$, $SD = 1.33\%$; $F = 4.32$, $df = 1.76$; $p < 0.05$). The study did not demonstrate significant differences in HbA1c levels by communication quality in patients with secure, preoccupied, or fearful attachment styles. A major limitation of the

study was the majority of the participants were white, educated, and employed and insured by the HMO. The authors indicate the level of attachment is a relatively stable trait and it is unlikely that no adherence would affect the diabetes treatment. The strength of the study demonstrated naturalistic data in a large HMO primary care population and for which they were able to obtain objective data from Pharmacy, Laboratory and Utilization Review departments. The study demonstrated that patients that had perceived good communication with their provider had improved glycosylated hemoglobin. An area of further research discussed by authors included the use a short attachment measure to identify patients with problematic adherence. The implication for practice suggests that further research is needed to address the non-adherence in diabetes with attention on provider-patient relationships (2001).

In a study similarly evaluating HbA1c levels, Clancy et al. (2007), examined clinical outcomes comparing group appointments and traditional office visits. They conducted a randomized control study over a 24-week period and measured HbA1c, blood pressure and lipid levels with data collected at 6 and 12-month intervals. A total of 186 patients demonstrating a HbA1c level > 8.0 were recruited to participate. Participants were assigned to the intervention group (n=96; GMA) and to control group (n=90; usual care). The primary outcome measures were based on the 10 American Diabetes Association (ADA) guidelines for diabetic care which included: ACEI/ARB, aspirin, cholesterol measurement, and cholesterol treated, HbA1C, micro albumin, pneumovax, influenza vaccine, foot examination and eye examination (American Diabetes Association, 2004).

The data analyzed applied the intention-to-treat principle which provide randomized and baseline parameters. The researches applied the *t* test for continuous outcomes and nonparametric Wilcoxon rank-sum test for ordinal and nonparametric data. The findings suggested that patients in the intervention group ($n = 64$) patients, had at least 8 process-of-care indicators completed as compared to ($n = 24$) controlled patients ($p > 0.0001$). The results showed that 41 of the intervention patients completed 9 process-of-care indicators compared to only 9 control patients ($p > .0001$). Interestingly enough, 17 intervention patients and no control patients had all 10 process-of-care indicators performed ($p > .0001$). The researchers then combined all the indicators. The mean number of criteria met in intervention patients was 7.93 ± 0.18 versus 6.13 ± 0.22 in control patients unadjusted (p >.0001). Further, Clancy and associates found that women who had attended the group visits had stricter adherence to screening for breast and cervical cancer. The authors do make mention that incorporating motivational and behavioral strategies emphasizing patients' daily responsibilities and skill building for healthy lifestyles compatible with diabetes may improve clinical outcomes. The authors claim that modifying how group appointments are organized may improve clinical outcomes such as taking into consideration the participants' education, language and motivation (2007).

De Vries et al. (2008) examined the practice of psychotherapy in group appointments applying Yamon's theoretical framework. The study design was a retrospective de-identified chart audit that collected demographic data and outcome measures for participants in GMAs and looked at participants with a diagnosis of chronic obstructive pulmonary disease (COPD) with a mean age of 67 ($SD = 9.23$). The researchers collected information before and after participating in the GMAs. Results suggest that patients attending GMAs had improved

clinical outcomes with decreased usage of bronchodilators, oral corticosteroids, and cessation of smoking and improved pulmonary rehabilitation. A limitation of the study was that it was quite a small select number of patients ($n = 6$) and was limited to Caucasian individuals. The results reported that four participants attended 100% of the GMA, one attended 75% of the GMAs and one attended 50% of the GMAs. The findings pertained to utilization of health care services, nonpharmacological and pharmacological measurements and improvement in exercise tolerance. The results suggest there was increased usage of health care services in office visits at the 3-month interval group medical appointments as compared to the individual office appointment. The study showed no increase in oral corticosteroid or bronchodilator use. However, there was an increase in depression screening that was included in planned visits form, which leads to further screening and referral. The investigators of this research do suggest that GMAs can work for other chronic conditions (e.g. type 2 diabetes) and that further research should be conducted. Another recommendation from the study is to have at least six patients participate in a 90-minute group session to be cost effective, as the NP in this practice would normally see four to six patients in 90 minutes individually (2008).

In a related study, Kinmonth et al. (1998), randomly assigned patients to patient-centered care groups and compared outcomes to patients attending routine group appointments. The study examined 250 patients ages 30-70 years of age diagnosed with type 2 diabetes and whom had follow up in one year . They measured HbA1c, cholesterol, weight, height, systolic and diastolic blood pressure, medication adherence and patient ratings of communication with doctors and nurses, perceived control of diabetes, and knowledge of the complication of diabetes. Additional outcome measurements included lifestyle and

psychological status. Results of the study indicate that the power of consultation and collaborative relationships with patients improves their clinical outcomes and suggest that patients must not lose focus of the disease while paying attention to their experiences. The study did demonstrate that patients participating in GMAs did have improved clinical outcomes which were attributed to improved communication skills between provider and patient. Further, the study findings indicated that there needs to be greater attention in the consultation process and not just in the disease management aspect of the diabetes. The study highlights the importance of consultation as a means for improving disease outcomes and patient well-being. These must be balanced with identifying and managing the risk factors associated with disease (1998).

Similarly, Deakin et al. (2008) conducted a systematic review of 8 randomized control studies and 3 controlled clinical trials. Data at 4 to 6-month and 12 to 14-month intervals was evaluated. Deakin and colleagues concluded that group-based care (e.g. GMAs) had improved clinical outcomes. An important finding from this study suggests that GMAs do not need to be delivered by a physician, nurse, or dietician as long as there is a health care professional to coordinate care delivery. They recommend that further research to determine theoretical underpinnings to assess the effectiveness of patient education, patient empowerment, participation and adult learning principles. Another finding suggests further research is needed to determine the efficacy of optimum blood pressure readings, treatment satisfaction, and group education on quality of life, efficacy of the program for minority groups, risk reduction for developing complications, and the cost effectiveness of delivering GMAs (2008).

Evaluating related outcomes, Jaber et al. (2006) reviewed thirty-three articles specifically centered on patient satisfaction, health service utilization, quality of care, healthy behaviors, self-care, self-efficacy, physical function, depression, quality of life, disease specific outcomes, cost of care, and satisfaction of physician's participation. Based on Jaber and associates review, GMAs do provide for increased patient satisfaction and improved quality of life as evidenced by improved quality of care indicators (2006). The review by Jaber et al. reinforces the idea that group appointments are an adjunctive model for chronic disease management. A challenge of the critique by Jaber et al. was that their meta-analysis did not clarify and explain the results as there were no consistent techniques used to evaluate group models, education content, presentation style, population group inclusion, and length or frequency of program. Their meta-analysis does suggest that GMAs do provide for increased patient satisfaction and improved quality of life and quality of care indicators. The authors make mention that GMAs should be utilized as an adjunctive model for chronic disease management (2006).

Rachamni et al. (2002) conducted a randomized prospective study of 165 patients with a diagnosis of type 2 diabetes, hypertension and hyperlipidemia. Participants were randomly assigned to a Standard Consultation program (SC; regular office visit) or to a Patient Participation program (PP; GMA). Participants in both groups were compared based on their age, BMI, duration of diabetes, blood pressure values, eGFR, urinary albumin/creatinine ratio, HbA1c, LD, HDL, and triglyceride levels. At the end of the 4 year period, results included mean blood pressures of 148/88 ($\pm$ 6.1/1.7) mmHg in SC patients versus 142/84 ($\pm$ 5.8/1.8) mmHg in the PP group; the lower blood pressure for the PP group was statistically significant ($p = 0.02$). The mean LD-C was 124 $\pm$ 8 mg/dl (SC) and 114 $\pm$ 6

mg/dl (PP), this difference statistically significant for the PP group ($p = 0.001$). The mean HbA1c was 8.9 $\pm$1.2% (SC) and 8.2 $\pm$ 1.5% (PP), this difference statistically significant for the PP group ($p = 0.04$). The average annual fall in eGFR was 3.5 ml/min per year in the SC group versus 2.25 in the PP group. Furthermore, the results demonstrated that the albumin/creatinine ratio was >300 mg/g occurred in the SC in compared to none in the PP group. There were a total of 36 cardiovascular events in the SC groups compared to 23 in the PP group ($p = 0.04$). It was noted that 100% of the patients in the PP group received ACE inhibitors (or AII blockers) and statins, whereas 52% of the SC group received ACE inhibitors and 43 % received statins. The authors do note that glucose lowering regimes were not different in the two groups. However, a large number of patients in PP group took metformin and the improvement in HbA1c was attributed to increased physical activity, adherence to medical regime and motivation. The authors noted it was a challenge to keep patients motivated and patient compliance was a struggle at times. The authors do indicate that patients who are highly motivated and want continued support from their providers have improved laboratory results. A weakness of the study was the lack of direct objective information regarding patient compliance, as well as small sample size precluded the use of definite end points, such as mortality or end-stage renal disease (2002).

Type 2 diabetes self-management

Norris et al. (2001) conducted a systematic review of 72 studies described in 84 articles that examined specific clinical indicators in the self-management of type 2 diabetes. It was noted that effects of interventions on lipids, physical activity, weight, and blood pressure were variable, Interventions that used regular support throughout follow-up were more effective in improving glycemic control. Educational interventions that involved patient

collaboration may be more effective than didactic interventions in improving glycemic control, weight, and lipid profiles. None of the studies demonstrated the effectiveness of self-management training on cardiovascular disease-related events or mortality. The authors point out that little has changed in the last 10 years as researchers focus more on glycemic control and outcomes rather than a holistic view of patient function and longevity. The literature reviewed for this project provided mixed results supporting interventions that focus on knowledge, lifestyles, or skills associated with group medical appointments and/or individual therapy. It was noted that lifestyle interventions were generally more effective in group settings. Positive outcomes were noted for weight loss and glycemic controls, although two studies of lifestyle interventions in individual settings had positive effects on weight. Individual and group lifestyle interventions had positive effects on diet and self-care behaviors. Norris et al., emphasize that further research is needed to evaluate self-management and lifestyle medicine as it relates to type 2 diabetes. The authors imply that behavioral theory must have an explicit role in future studies to improve the understanding of behavior change in self-management of chronic illness. The authors do imply that the objectives for self-management must be clear and behavioral interventions must be practical and feasible in a variety of settings. The authors recommend that further research is necessary in self-management interventions on sustained glycemic control, cardiovascular risk factors, and ultimately, microvascular and cardiovascular disease and quality of life (2001).

Gold et al. (2008) compared two groups of participants based on the types of models of care: standard management group (SMG) and intensive management group (IMG). The intensive management group consisted of self-management diabetes education group

sessions concurrent with provider visits. The participants had the option of an individual session with a certified diabetes nurse-educator, a dietician, and or a medical social worker. The SMG consisted of a primary care provider visit and participants were encouraged to partake in institution-sponsored diabetes self-care classes conducted by comparable diabetes educators. There were $n = 23$ participants in the IMG group and $n = 21$ in the SMG. All were of Hispanic ancestry and this particular group had a long-standing history of poorly controlled diabetes. In both groups a total of 9 patients were lost to follow-up. The researchers evaluated HbA1c assessments within 3 months and 6-months post intervention. The data was analyzed using descriptive statistics and compared x^2 and t tests for categorical and continuous variables. . The decline in HbA1c level from the baseline participants in the IMG group was statistically significant ($p < 0.001$), whereas no significant decline in HbA1c level was found in the SMG. The Gold et al. study suggests that self-management education and an intensive multidisciplinary approach should be considered in the management of diabetes for improving HbA1c levels. Limitations of the study include potential biases by health care providers because they were aware of patient assignment to groups, small sample sizes, and limited duration of post-interventions. The patients attended an average of 2 sessions over the 6-month intervention period. Based on their study, the authors believe that it would be cost effective, in both public and private settings, to synchronize concurrent multidisciplinary education/counseling sessions with regular provider visits in pursuit for optimal glycemic control. The authors recommend that a multidisciplinary approach to diabetes management was effective for their study (2008).

Ingadottir and Halldorsdottir (2008) conducted a qualitative study that involved eleven participants, six women and five men between the ages of 28 and 84. Data analysis consisted of transcribed verbatim interviews and was analyzed according to the Vancouver School of Doing Phenomenology. The premise behind the Vancouver School is living and immersing oneself in the data with an open mind to prevent premature closure of the analysis which is key when looking at qualitative data. The researchers identified key statements and themes that pertained to diabetes that enabled them to find the key phenomenon for a particular individual. The researchers then examined all the dialogue in order to establish themes or sub-themes. Then they verified the interpretation of each case construction relevant to the participant. The findings that were similar among the participants included knowledge and understanding diabetes, fear of hypoglycemia and complications. The results of the research offered insightful meaning into people's lives when diagnosed with diabetes. This study suggests further intervention addressing the effects of self-help groups on well-being and self-management. The study provides ample room for further research to improve the manner in which individuals master and manage their diabetes and other chronic illnesses (2008).

In their study, Sarkar et al. (2006) applied social cognitive theory and self-efficacy constructs to diabetes self-management, particularly as these constructs relate to race, ethnicity, and health literacy. The researchers had identified potential subjects from clinical and administrative data bases and individuals with end stage renal disease, dementia, blindness, dementia or psychiatric disorders were excluded from the study. Patients eligible to participate were >30 years of age and either spoke English or Spanish and had type 2 controlled or uncontrolled diabetes. Patients were required to have the same physician for

two visits at both 6 and 12-month intervals (2006). The researchers adapted a previously published, validated diabetes self-efficacy scale that used a 4-point Likert type response from "1 = not at all sure" to"4= very sure" to assess their ability with self-management of their disease. The population consisted of 408 ethnically-diverse participants. The association between self-efficacy and self-management was consistent across race, ethnicity and health literacy levels; and self-efficacy was significantly underscored in the vulnerable populations. Sakar and colleagues felt that further research would need to be done with more racially and ethnically-diverse populations to ensure that the data provided more substantial information on diabetes management (2006). In this study, the researchers applied The Summary of Diabetes Self-Care Activities Questionnaire in assessing self-management. To address disease related variability in self-management, the researchers tested clinical characteristics such as duration of diabetes, medication regimen and presence of complications in multivariate models. The researchers looked at health literacy score, a contentious variable for self-efficacy and self-management. Results indicated that self-efficacy was significantly associated with improvement in diet, exercise, HbA1c and foot care. It was noted that self-efficacy was significantly underscored in the vulnerable population. In disadvantaged populations a variety of experiences and barriers may undermine self-management performance including co-morbid conditions such as depression or chronic pain. In low income neighborhoods the scarcity of food and room to exercise may limit self-efficacy and self-management. The researchers felt that further studies would need to be conducted in more racially and ethically diverse populations to ensure that data provides more substantial information on diabetes management (2006).

Similarly, Shah and Booth (2008) examined the effectiveness of diabetes self-management education. In this retrospective study, participants (n = 747) completed a questionnaire to indicate if they visited any diabetes education center (DEC) in Ontario between August 2003 and December 2004. The researchers also examined the relationship between glycemic control, complications associated with diabetes, and treatment from a primary health care provider. The results demonstrated that participants who were diagnosed with diabetes had attended a DEC to gain further knowledge of their disease, as well as, education on how to manage their disease. The study also suggested that people with regular primary care providers made use of self-management programs. As a result, ophthalmic screening as part of diabetes management may have improved. This study had limited inclusion and exclusion criteria within the community settings suggesting that the sample was more robust because it demonstrated real time clinical care. Self reported questionnaires could be prone to biases creating a weakness in the study (2008).

Sidorov et al. (2002) examined the value of diabetes management in improving clinical outcomes and financial gain. The study compared health care costs for patients who completed health employer data and information set (HEDIS) criteria for diabetes and were enrolled in a health maintenance organization (HMO)-sponsored disease management program .The setting of the design and research included the Geisinger Health Plan (GHP) which is a federally qualified, not-for-profit group model HMO. A total of 3, 118 (45.9%) participants had enrolled in disease management programs and were managed by 51 disease management nurses compared to 3,681 (54.1%) subjects who were not in disease management programs. Results concluded that the average number of visits with a HMO nurse was 3.63 to be effective. Patients in the 2 year study, had expenditures of $394.62 per

month in mean total of paid claims compared to $502.48 for those in sponsored disease management programs. These patients achieved a higher HEDIS score for HbA1c, as well as testing for lipid, eye, and kidney screenings. Study findings demonstrated that people enrolled in group education for diabetes self-management had improved clinical outcomes. The study validates that nurses can be champions of clinical practice guidelines in providing diabetes education. A weakness of the study is the data was restricted to claims analysis and the ICD-9 codes utilized were significantly influenced by selection (2002).

In a different study, Thoolen et al. (2007) randomly assigned participants to a control group that received no education on self-management and an intervention group where they received a self-management course to reduce the risk of cardiovascular disease for patients with type 2 diabetes. All participants also either received their usual care or augmented pharmacological care. The participants were recruited from the Dutch arm of the ADDITION study (Anglo-Danish-Dutch Study of Intensive Treatment of People with Screen-Detected Type 2 Diabetes) being followed in a primary care setting. Patients (n = 227), between the ages of 50 and 74, were invited to participate in the study which lasted from 2002 to 2004. The data analysis used was a *2 x2* factorial design to evaluate a self-management course nested within the medical team (intensive versus usual care) using multilevel regression modeling to analyze changes in patients' body mass index (BMI), HbA1c, blood pressure (BP) and lipid profiles over a 12-month period. Measurements were recorded at the onset of the study and again at 3 and 9-month intervals. Regardless of whether participants received usual or augmented care, there was significant weight loss (-0.77 kg/m^2) and a reduction in systolic BP (-6.2mmHg) at least through the 9-month period. It was noted that for patients who received augmented (intensive) pharmacological care there were improved HbA1c, total

cholesterol, LDL levels, and further lowering of systolic BP. Results demonstrated that a self-management intervention can be effective in decreasing cardiovascular risk in diabetes. The authors suggested that a behavioral approach was more effective than a medical approach to enhance weight loss for participants. A flaw of the study was that time point measurements were inconsistently recorded which was thought to be related to the general practitioner or laboratory and this led to skewed data and results (2007)

Relying on theories of locus of control, Trento et al. (2005) conducted a post-hoc analysis where the investigators studied 56 patients followed by group care (intervention group) and 51 patients receiving usual care (control group), all patients participated in cohorts that were originally randomized in 1996, and randomized again 2 years later. Locus of control was measured by two separate questionnaires, one specific for diabetes and one generic for chronic disease. The questionnaire by Peyrot and Rubin (1994) utilized for the study included a set of 18 statements measuring expectations of internal, chance, and "powerful other" control over diabetes-related health outcomes and drawing upon the Multidimensional Health Locus of Control (MHLC). The Walston and Walston (1976) questionnaire used for the study was more generalized as it reflected a number of beliefs without thinking of one particular subject. The Powerful other Health Locus of Control scales (PHLC) measure the subjects' belief that other individuals more powerful than themselves (relatives, friends, cares) control their health The Chance Health Locus of Control (CHLC) scale measures the perceived lack of control over health or the conviction that the subject's state of health is determined by chance, destiny, or both. The data was analyzed by carrying out a t-test for independent data. The variables of gender, age, family history, schooling and duration of diabetes between groups were controlled for by applying a multivariate

regression model. The statistical package for social sciences was applied for calculations and to check for validity of questionnaires. Results indicated that patients followed by group care had more internal locus of control using the Peyrot & Rubin instrument, compared to the Wallston and Wallston tool. The findings indicated that there may be lower insulin resistance seen in patients with a greater locus of control. Type 2 diabetes requires constant support rather than emergent medical support (2005).

Finally, Steed et al. (2002), examine a systematic review of psychosocial outcomes following education, self-management and psychological interventions in diabetes mellitus. The authors reviewed thirty-six studies which evaluated either psychological well-being or quality of life. Fifty-four percent of the participants had type 2 diabetes and 11% had type 1. The ages ranged from 24-70 years. The authors provide a detailed summary of their findings from the literature synthesis. They determined that general education was a frequent component in approximately 75 % of the studies reviewed, while 57% of the studies mentioned self-management and psychological interventions for diabetes management (2002). The authors concluded that the review of education, self-management and psychological interventions are unlikely to have any impact (positive or negative) on the quality of life of people for individuals with type 2 diabetes. The relationship between self-management behaviors can lead to improved psychological well-being. The authors denote that the content contained great variation among the population of participants. The study supports both self management and psychological intervention. It would be recommended that future studies would benefit from being larger with controlled designs, applying specific diabetic measures with clearer interventions (2002).

Nurse Practitioner Coaching

Hayes and Kalmakis (2007) provided results from a qualitative review of literature. The major variables studied included face-to-face appointments, telephone interviews, email communication, and coaching sessions with patients during a 6-month period. The investigators measured the effectiveness of a coaching intervention with biomedical outcomes such as cholesterol and blood glucose levels, asthma symptoms, comfort, activity levels, and healthy behaviors. The challenge for practice is that nurse practitioner coaching is still in its infancy and nurse practitioners (NP) need to learn coaching skills to effectively motivate their patients to incorporate lifestyle behavioral strategies to improve outcomes associated with their chronic conditions (2007).

Discussing similar trends in the literature regarding coaching strategies and patient compliance behaviors, Hayes et al. (2008) found that NPs need to familiarize themselves with strategies to support self-management in patients with type 2 diabetes. This literature review examined issues affecting diabetes management, coaching and communication. The results of literature reviewed by Hayes et al. discussed many strategies to promote client adherence to treatment guidelines. However, the biggest challenge comes from motivating patients to actually change their behavior. A recommendation from the authors is to teach NPs a how to effectively coach patients in order to implement behavioral changes. There have been several theoretical frameworks that have been proposed for effective behavioral change. Hayes and colleagues refered to the Trans-Theoretical Model for Change (TTM) as one potential model to consider. The authors indicated that coaching can be incorporated into office visits without any real cost to support and empower patients with behavior changes

strategies. The authors do recommend that in order to implement this type of intervention, formal education for both NPs and NP students should be developed (2008).

Applying the Adaptations of Chronic Illness Model, Whittemore et al. (2001) designed a study to systematically evaluate nursing coaching interventions after diabetes education classes. Women were primarily targeted because they play an important role in overall family health. The researchers looked at daily outcome measures including fasting blood sugar (FBS), dietary behaviors, daily weight, and daily exercise patterns. Initially, sample sizes to explore the effectiveness of behavioral interventions on these patterns were small (n = 9). Ninety-seven (97) percent of the participants attended the nurse coaching session with only one participant missing their session. The research demonstrated that the lived experience of the participant receiving the intervention was an important aspect to consider when tailoring education. Moreover, the research demonstrated that coaching is an effective intervention that should be applied in clinical practice. The authors imply that further research with an intervention using coaching would be beneficial for implementing individualized nursing care. The excellent attendance rates obtained in the study reflect the potential for positive health promotion and lifestyle modification necessary to better manage patients with type 2 diabetes (2001).

In a later study, Whittemore et al. (2002) examined lifestyle changes in women with type 2 diabetes focusing on age, general health and knowledge of diabetes. Data analysis consisted of taped interviews in which patients reflected on their lived experiences with type 2 diabetes. As part of data collection methods, a process flow chart mapped out progress from the time of diagnosis. The research concluded that integrating lifestyle changes in type 2 diabetes is a complex process and is both challenging for the health care provider and the

patient. The participants looked at developing tools for self-management. The authors imply that further research is necessary to focus on lifestyle changes approaches with other population types, as well as for individuals with diabetes and other chronic illnesses (2002).

To further extend their original work, Whittemore et al. (2004) examined nurse coaching as an intervention for women with type 2 diabetes. The researchers applied a model of care known as the Adaption to Diabetes Model (ADM) which examines human responses to chronic illness. A randomized clinical trial was carried out where women from an outpatient diabetes department were recruited. Participants (n = 53) either received their standard care (control group) or nurse coaching (treatment group receiving 5 individual sessions and 2 follow-up telephone calls) over a period of 6 months. A number of clinical variables including glycemic control, BMI, HbA1c, and self-management were evaluated. Data was analyzed by double entering the data into databases and comparative analyses was completed for accuracy. The mean age of the women was 57.6 years, mean education level was 12.6 years, and mean years living with diabetes was 2.7 years. Eighty-nine (89) percent of the women were Caucasian, 11% were Hispanic, and 70% were married or living with significant others. The income level for this group was very low. Overall, there were no statistically significant ($p < 0.05$) differences between the standard care and coaching groups, although participants in the coaching group did demonstrate better self-management of diet, stress, exercise, BMI, and improved satisfaction with their care. The strength of this study suggests that a nurse coaching intervention addresses well-documented issues pertaining to diabetes self-management. The authors contend that people who do not have a reasonable understanding of diabetes management have difficulty in applying specialized knowledge in

everyday life. The weakness of the study is that it was small, albeit very motivated and relatively homogenous sample recruited from one geographical area (2004).

Chronic disease management

Litaker et al. (2003) examined specific outcome measurements to determine whether physician-nurse teams are effective in chronic disease management. This study examined particular variables in diabetes management and compared participants in randomly assigned groups, either with nurse practitioner-physician team (n = 79) or simply with a primary care physician (non-team approach; n = 78). The study was terminated after 16 months due to resources and enrollment issues. Data was collected utilizing two measurement tools: the Health-Related Quality of Life (HRQoL) and the Diabetes Quality of Life (DQOL) scales. The researchers conducted pre and post-comparisons using a distribution-appropriated paired analytic approach to evaluate trends in multiple mean arterial blood pressure readings, and blood glucose as reflected by HbA1c . The results indicated that 1-year costs for personnel were higher in the team-treated group although participants experienced significant improvements in mean HbA1c . Researchers in this study observed that the effect of team management on diabetic control disappeared within 12 months after study completion. In a post-hoc analysis of study participants, HbA1c values were obtained using a laboratory databases at 6 and 12-months following disenrollment from the study. Although, no dramatic changes were noted for individuals assigned to usual care, there was a rapid return of mean HbA1c to pre- enrollment levles for individuals previously treated by the NP-MD team. Interestingly, when time spent was calculated over the 1 year, NP-MD teams had an average contact time of 1809 minutes compared to 85 minutes for those in the usual care group. There was increased satisfaction of care with NP-MD team. This finding is linked to

increased time spent on patient-centered education and self-management. The potential value of ongoing interaction with the team is substantiated by the rapid return of HbA1c levels to pre-study levels once team contact was terminated. The study demonstrates that the professional experiences and educational background of NPs complement physician-based practice. The results support a collaborative partnership approach (NP with physicians) is a method of care that needs to be further explored (2003).

Utilizing the same HRQoL scale, Luscombe (2000) found that clinicians need to consider the population, diagnoses, and group characteristics when implementing assessment tools. The authors hint that HRQoL measurement tools may be more appropriate when discerning between types of chronic diseases, patient subgroups, as well as level of disease severity (2000). Luscombe further suggests that specific-disease instruments may closely align to diabetes rather than using generic tools. Specifically, Luscombe suggests that both the Diabetes Quality of Life (DQOL) measure and the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) were specifically developed for patients with type 1 diabetes. Interestingly, there were mixed results when using these instruments with patients with type 2 diabetes.

MacDonald et al (2008) applied constructs from Corbin and Strauss's (1991) illness trajectory model. Their qualitative study reviewed semi-structured and face-to-face interviews from recorded transcripts. From the nurse's account, themes and sub-themes emerged from the transcriptions. The themes that emerged in the early stages included making sense of the patient and their condition, categorizing patients, diagnosis as an initial point consideration when developing a working relationship with patients, and patient education. In the intermediate stages, sub-themes emerged which included: ways of working

with patients, breaking the task down, cognitive restructuring and addressing dissonance, modeling how to behave, encouragement, listening, involving careers and referral as a resolution to becoming "stuck". In the latter stages, nurses lacked skills and intuitive ways in supporting patient self-care. Their analysis concluded that working with patients that have chronic disease varied depending on the length of time from diagnosis and where they were in their chronic disease trajectory. The study conducted by Macdonald et al. suggests that further research, particularly evaluating how nurses impact chronic disease management, is required (2008).

Ockleford et al. (2007) conducted a qualitative study in which the authors evaluated patients' views related to a new diagnosis of type 2 diabetes. In their study, they briefly discuss two frameworks: the National Institute for Clinical Excellence (NICE) framework that specifies that patients receive structured educational information at the time of diagnosis, and the Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) framework. Using both frameworks, they evaluated the experience of being diagnosed with diabetes, available sources of information pertaining to diabetes and its application to them, and how diabetes affected their lives and their relationship with a health care professional. The participants (n=36) were interviewed within six months of their diagnosis and were either interviewed in their home or at another location. Interviews were up to one hour in length. Nineteen people had attended the DESMOND education and the remainder were randomized to receive standard care

Findings from the study contend that people with diabetes are trying to find some normalcy to their life and are attempting to overcome challenges in managing their diabetes. The researchers do note it was difficult to identify striking thematic differences between

accounts of people related to different aspects of the study, especially when looking at self-management of their diabetes (2007).

Paul et al. (2007) conducted a study to evaluate the effectiveness of peer support for patients (n = 22) with type 2 diabetes seen in primary care settings. Peer support was evaluated through a series of phases (preclinical, phase 1, and phase 2). During phase 2 (the pilot phase to test feasibility of peer support), 4 peer supporters worked with patients in two primary care settings. Quantitative and qualitative data related to peer supporters was collected. Based on preliminary positive results obtained from the pilot (phase 2) of the study, the framework was to be tested in a larger randomized control trial involving 420 patients with type 2 diabetes at a later date. The strength of the study is that a framework was developed and evaluated at the same time, which provided the researchers with current data to continually improve one peer support program (2007).

Applying Symbolic Interaction Theory (SIT), Tang et al. (2008) utilized a cross-sectional, observational design to study diabetes-specific quality of life as measured by the Diabetes Distress Scale (DDS). Participants (n = 89) included African American adults age 40 or greater, with a mean age of 60, and diagnosed with type 2 diabetes. Independent variables measured included positive and negative supportive behavior applying the Diabetes Family Behavior Check list-II (DFBC-II). Results obtained from the study suggest that satisfaction with support was a predictor for improved diabetes-specific quality of life (r =-.579, $p < 0.001$) and blood glucose monitoring (r= .258, $P < 0.05$). It was noted that positive support behavior was a predicator for following a healthy eating plan, spacing out carbohydrates evenly throughout the day, and performing physical activity at least 30 minutes per day. Results of the study demonstrated that men receive greater amounts of

social support experience greater satisfaction with social support. It was noted that participants who were married reported receiving a greater amount of social support and satisfaction with behavioral changes. The authors suggest that there was a significant relationship between educational level and social support. Specifically, patients with more years of education were less likely to be satisfied with the support they received and they also required more positive support behaviors. Participants who did not feel that they had the same amount of support were noted to be non-compliant with their medication. The authors found that people living with diabetes have continual and long-term challenges. The measures of positive and negative support behavior did not include specific items related to foot care. This study did not address emotional, instrumental information and how support can differentially influence self-care behaviors. This study only focused on African American patients so perhaps with other ethnic groups the results might have been different. Implications proposed by the researchers suggested that diabetes educators may need to teach patients how to recognize different dimensions of social support. The authors also implied that when designing a support program, it is important to consider gender differences as social support may vary between genders (2008).

Summary of findings

Appendix A and B provide the reader with quick summaries of clinical practice guidelines and major themes in articles reviewed for this project. There are a vast collection of questionnaires that are available to health care providers to utilize when assessing self-management and self-efficacy in diabetes. These instruments may provide valuable information for both clinicians and patients in developing health care plans (Luscombe, 2000; Tennvall et al., 2006 and Shah and Booth, 2008).

Group medical appointments (GMA) are a promising approach in providing multidisciplinary health care. This theme was supported by a number of the researchers in this review. De Vries et al. (2008) and Sidorov et al. (2002) agreed that group medical appointments provide a venue for health care providers to deliver integrated, more efficient, quality health care services when compared to single office appointments. De Vries et al., (2008) and Gold et al., (2009) agreed that GMA provide synchronous and organized medical care and participants have access to a multidisciplinary interventions that improve health outcomes and demonstrate improved clinical outcomes. Kinmonth et al. (1998) supported that patients participating with group care had improved clinical outcomes. Litaker et al. (2003) and Jaber et al (2006) contend that nurse practitioner (NP)-physician teams improve patient outcomes by supporting self-management for the motivated patient living day-to-day with their chronic health condition. The majority of the research was mainly in the United Kingdom and the United States which may not be reflective of the health care system in Canada. There are, however, some similarities in how GMAs are organized which can be applied to current practice at KDHC.

Patients participating in GMAs gain valuable knowledge in making behavioral changes that support self-management of their diabetes. The challenge is that patients need to be motivated to continue with ongoing support to improve clinical outcomes (Norris, et al, 2001). Sidorov et al. (2002) identified that patients enrolled in diabetes management programs had improved HbA1c and that programs championed by nurses can assist patients in diabetes education in improvement of clinical outcomes. More importantly, type 2 diabetes requires continuous support and the ability to provide GMAs creates an atmosphere for

patients to learn about their chronic health condition and to support them with self-management (Rachamni et al. 2002; Trento et al. 2005).

Self-management is an essential part of chronic disease management for patients living with type 2 diabetes. A significant finding by Ingadottir and Halldorsdottir (2008) identified that patients need to define their own meaning of health when diagnosed with a chronic health condition as they are then able to develop their own understanding self-management. Sarkar, et al (2006) emphasized that self-efficacy is evident when evaluating self-management and clinical outcomes such as diet, exercise and foot care.

Developing strong social and provider support is often associated with improved patient outcomes and reduced complications (Luscombe, 2000; Tang et al., 2008). Ockleford, et al. (2007) recap that patients need to be more involved in their self-management care and that self care action needs to be understood in the context of care provided. This view is important when developing a collaborative care team which includes nurse practitioner and physician teams. Patient education needs to be provided in an environment that is appropriate and creates a setting for learning. Self-management support in type 2 diabetes has been demonstrated to improve clinical outcomes with HgbA1c, as well as medication adherence (Ciechanowski et al., 2001). The challenges that patients continue to face is maintaining self-management behaviors specific to glycemic control, quality of life and the prevention of cardiovascular disease (Ciechanowski et al., 2001; Norris, et al., 2001).

Macdonald et al. (2008) pointed out that nurses need to have a clear understanding of the stages of change when supporting patients with self-management behaviors. This relates especially true when nurse practitioners provide coaching interventions to support patients in life style changes and encourage self-management. A fundamental part of chronic disease management is a coaching intervention which is a competency standard of the National Organization of Nurse Practitioner Faculties (Hayes & Kalmakis, 2007; Hayes, McCahon, et al., 2008). NP coaching is a holistic and shared approach to patient care and provides an intervention for patients to reach their goals (Hayes & Kalmakis, 2007; Hayes et al., 2008). The role of the NP coach is to guide the person through a series of reflections and to engage in self-management. Whittemore et al., (2001) make reference to nurse coaching as similar to motivational interviewing and through support and education clients are guided with health promoting behaviors. Kinmonth et al. (1998) supported that nurses can improve patient well-being by improving communication where trust and listening plays a significant intervention for supporting self-management and motivation to succeed. Thoolen et al. (2007) demonstrated that self-management teaching and supporting patients with lifestyle changes show significant improvement with weight, body mass index (BMI) and HgbA1c. Thoolen et al. (2007) found that applying theory-based interventions can assist patients in improving self-management. A further area of exploration would consist of applying motivational interviewing in supporting nurse practitioner coaching to motivate self management with patients with type 2 diabetes. Lifestyle changes are an ongoing process and patients require continuous support in working towards individual goals and self-management (Whittemore et al., 2001).

Section three provides a brief discussion of the implications for practice as well as challenges associated with the implementation of GMAs at the KDHC. Recommendations for NP practice, particularly as they pertain to the management of type 2 diabetes at the KDHC are also provided in the following section.

SECTION THREE

IMPLICATIONS & RECOMMENDATIONS FOR NP PRACTICE

The literature review provided significant findings for the further improvement and structure of the GMAs at the KDHC. The findings imply that patients with type 2 diabetes require continuous ongoing support in self-management skills to effectively manage their diabetes. The following sections outline implications for nursing practice, as well as strategies to incorporate GMAs for NP practice in order to facilitate better outcomes for patients with type 2 diabetes

Implications for NP Practice

Nurse practitioners have a significant role in chronic disease management. Their expertise in communication and health promotion are significant in developing further work with type 2 diabetes as a chronic disease. Based on information provided in Section 2, further studies are necessary that apply theoretical models or framework in chronic disease management especially related to type 2 diabetes. The next step towards helping NPs better manage type 2 diabetes is to apply current research and evidence and establish goals and objectives associated with GMA; linking these with clinical practice guidelines. A central theme that will require some work is developing measurable goals that are clinically objective and that can be measured by both provider and patient. Clinical practice guidelines will provide specific measurable outcomes, however the health-related quality of life measurement tools will require further evaluation to determine the most effective means for improving type 2 diabetes outcomes.

Challenges

The KDHC is always looking for ways to develop more efficient approaches to delivering health services. The success of the GMAs depends upon continued support from the manager, providers, and medical office assistants. The GMAs are facilitated by the primary care nurse. The schedules are a collaborative effort as the dietician informs staff of her availability which then creates a schedule for the GMAs, with the support of providers the medical office assistants. The ongoing challenge is to ensure the process flow continues and the GMAs are part of the daily function of the clinic. Entering chronic disease management data into a database is a labor-intensive task and this is complicated because documentation at the KHDC is paper-based, as well as electronic.

At present, the educational format has included self-management embedded into each of the organized lectures on carbohydrate counting, cardiovascular health, diabetes stress management and wellness. Nurse practitioners are an essential to collaborative care and often facilitate the patient/provider relationship, thereby uniquely supporting chronic disease management. Patient education does not specifically have an area on motivational interviewing or coaching rather it is embedded in health promotion work of the nurse practitioner. Further work and review of practice guidelines on NP coaching will the required to develop the self-management workshops for the GMAs.

Next steps in the implementation of GMAs

One hurdle to overcome before NPs might be effectively utilized to enhance the GMA model relates to how NPs are funded by the provincial government. Currently, health authorities have NP positions in areas where there is a need for primary care (L. Sawchenko, personal communication, February 5, 2008). With the ever increasing epidemic rates of type

2 diabetes, the question is determining the best funding method to place NPs into areas where primary prevention can improve health status of patients. Nurse practitioners are not to be a replacement for primary care providers; rather NPs need to be utilized as an addition to the collaborative team in chronic disease management.

Nurse Practitioners are an essential component in chronic disease management. The role of the nurse practitioner has been well-developed at KDHC. As a future NP at KDHC, the author of this project has observed that MD-NP teams do improve outcomes for patients with type 2 diabetes. A brief cursory review of clinical data has shown an improvement in HbA1c. The challenge of today's practice is the under-utilization of NPs in private physician offices and clinics. The literature review supports the notion that there are better patient outcomes and increased satisfaction with MD-NP teams in chronic disease management. This author was able to attend an Integrated Health Network Conference meeting in Spring 2009. There was a great deal of discussion and interest by physicians for employing NPs in clinics to develop GMAs as a means for enhancing chronic disease management strategies and initiatives. The following recommendations are proposed as next steps in the process for implementing GMAs at the KDHC:

1. Further explore the literature to identify trends in GMA processes as a means for improving outcomes for patients with type 2 diabetes;
2. Conduct a thorough review of the current GMA process at KDHC and identify streamlined processes for facilitating self-management and goal-setting strategies; this might take the form of a pilot study to determine the effectiveness of GMAs in this primary care facility;

3. Evaluate the feasibility of creating a province-wide standard for GMAs to manage type 2 diabetes.

Conclusions

Based on the literature reviewed for this project, GMAs with a multidisciplinary approach are an effective method of delivering efficient health care and improve outcomes for patients with type 2 diabetes. Specifically, nurse practitioner coaching intervention is an area of further study that will support patients in self-management. A multidisciplinary approach to chronic disease management is an important part of lifestyle medicine and client support with chronic health issues. The continued development of a multidisciplinary approach to chronic disease management at the KDHC will serve to be an example of collaborative health care management with the participants and health care providers. The next steps are to further evaluate patient outcomes and to further research the theoretical models in the application in participant assessment.

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Appendix A- Clinical Practice Guideline Summary

Diabetes Care
▪ Self-Management Topics ▪ Recommended Laboratory Screening and time intervals ▪ Screening for neuropathies and retinopathies (British Columbia Ministry of Health-GPAC, 2009)
National Standards for Diabetes Self-Management Education
▪ Ten key strategies associated with self-management (Funnel et al., 2008)

Appendix B- Key Findings of Literature Review

Group Medical Appointments (GMAs): 7 Articles Reviewed	**Type 2 Diabetes Self-Management:** 11 Articles Reviewed
▪ Provider attachment associated with improved HgbA1c ▪ GMAs confirm improvement of care indicators and patient satisfaction, empowerment, quality of life ▪ GMAs offer continued support in motivating patients to sustain self-management	▪ Lifestyle interventions more effective in group settings ▪ Synchronize provider visits group visits ▪ Identifying patient's perception of what diabetes means to them (cultural sensitivity) ▪ Self-Management behaviors lead to improve psychological behavior
Nurse Practitioner Coaching: 5 Articles Reviewed	**Chronic Disease Management:** 6 Articles Reviewed
▪ NP coaching is new ▪ NPs need to learn motivational interviewing and is an effective intervention ▪ Many theoretical models applied for behavioral—TTM is proven to be effective and goes well with NP coaching ▪ NP coaching addresses self management	▪ Physician – NP teams effective in CDM management and increased patient satisfaction ▪ HRQoL measurement tools for type 2 diabetes require further research ▪ Positive supportive behavior a predicator for improved quality of life for patients with type 2 diabetes